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IN THE UNITED STATES PATENT & TRADEMARK OFFICE

IN RE APPLICATION OF :
THOMAS NARBESHUBER, ET AL. : EXAMINER: Y. VALENROD
SERIAL NO: 10/538,473 :
FILED: JUNE 7, 2005 : GROUP ART UNIT: 1621
FOR: PROCESS FOR THE PREPARATION OF ALKYLARYLSULFONATES BY
MEANS OF MODIFIED, DIMERIZED OLEFINS

REPLY BRIEF

COMMISSIONER FOR PATENTS
ALEXANDRIA, VIRGINIA 22313

SIR:

This is a reply to the Examiner's Answer dated October 3, 2008.

As set forth in Claim 8, the present invention relates to a process for the preparation of alkylarylsulfonates. An important aspect of the claimed process is the removal of 5 to 30% by weight, based on the C₁₀₋₁₂-olefins removed, of low-boiling constituents of the C₁₀₋₁₂-olefins, such that at least 90% of di- or poly-branched olefins are separated off. See (b) in Claim 8.

The claims stand rejected under 35 U.S.C. §103(a) over Maas et al. in view of Scheibel et al.

The Office recognizes that Maas et al. fail to disclose removal of 5 to 30% by weight, based on the C₁₀₋₁₂-olefins removed, of low-boiling constituents of the C₁₀₋₁₂-olefins, such that at least 90% of di- or poly-branched olefins are separated off as specified in Claim 8. See page 3 of the Office Action dated November 23, 2007.

The Examiner relies on Scheibel et al. to bridge this deficiency. The Examiner stated:

The document by Scheibel et al [sic] is only used to provide a general teaching that it is desirable to remove highly branched alkylbenzenesulfonate surfactants...from a mixture and that linear alkylbenzenesulfonates have limitations. If one is to follow the general teaching of Scheibel et al., one comes to the conclusion that what is desirable are non-highly branched compounds. The process of Scheibel et al. (which Appellant argues in detail on pages 4-7 of the Appeal Brief) is irrelevant to the rejection of record because it is only the teaching of unfavorable quantities of the undesired highly branched surfactants that is relevant. [Emphasis in original, see page 6 of the Examiner's Answer.]

The process used by Scheibel et al., as described in the Appeal Brief, *is relevant* in order to understand the products obtained with the process described in that reference. According to the last paragraph on page 6 of the reference, Scheibel et al. provide a process for “modifying an alkylaryl sulfonate surfactant by *reducing* linearity or “delinearization.” That portion of the reference also states that “the essence in the present invention is the notion that *linearity reduction* is processing by use of vinylidene olefins, especially when combined with a particular type of alkylation later in the process.

Thus, a person of ordinary skill in the art learns from Scheibel et al. that *branched alkylarylsulfonate surfactants are preferred*, because a process for *delinearization* is provided.

The process described by Scheibel et al. includes reacting, in the presence of the dimerization catalyst, an olefinic feed stock comprising α -olefins or mixtures thereof to form one or more vinylidene olefins having a carbon content of from 10 to 16 carbon atoms, see page 4, 4th paragraph. According to page 7, last paragraph of the reference, the opportunity to achieve a meaningful improvement by delinearization or branching in alkylbenzene sulfonate surfactants can be (i) selecting the feed stock wherein α -olefins consist essentially of a ternary mixture of α -olefins having 5 to 7 carbon atoms. According to page 8, second paragraph, the delinearized olefins according to Scheibel et al. are obtained by conducting the preparation steps without separation or extraction of said vinylidene olefins from oligomers,

The teaching of Scheibel et al. is that highly branched alkylarylsulfonate surfactants having improved characteristics can be obtained by a process comprising the dimerization of α -olefins, being olefins having the double bond in 1-position, in order to obtain dimerization products being olefins having vinylidene groups present in the alkyl chain. A proof for this can also be found on page 23 of the description of the present application, which states that α -olefins selectively react to vinylidenes, see lines 19 to 26 of page 23. This is in accordance with the teaching of Scheibel et al.

Further, in contrast to Scheibel et al., an increased amount of low boiling linear C₁₀₋₁₂-olefin constituents are removed after the dimerization step, so that at least 90% of the di- or polybranched olefins are separated off. This produces compounds which show improved biodegradability, because di- and polybranched olefins are removed which would cause low biodegradability.

A person of ordinary skill in the art looking for a process to such improved linear alkylaryl compounds which can further be sulfonated, would obtain from the teaching by Scheibel et al., that α -olefins shall be dimerized in order to obtain olefins having vinylidene groups. In addition, the such a person would conclude that these vinylidene-containing olefins give rise to advantageous highly branched alkylaryl compounds, which, in turn, give rise to advantageous alkylaryl sulfonate surfactants. Thus, a person of ordinary skill in the art would not conclude from Scheibel et al. that olefins having internal double bonds like 2-pentene and/or 3-hexene should be used in order to get predominantly linear compounds. A person of ordinary skill in the art also would not conclude that terminal aryl alkanes shall be present in an amount of about 50% but not more, because Scheibel et al. teach an amount of at least 50%, preferably at least 90%.

In addition, a person of ordinary skill in the art would not conclude from the teaching from Scheibel et al to remove di- or polybranched C₁₀₋₁₂-olefins from the mixture obtained in the dimerization step, because the reference teaches that these compounds are the preferred olefins. Therefore, Scheibel et al. cannot point in the direction that these compounds shall be removed, in order to improve biodegradability.

Therefore, a person of ordinary skill in the art would have from Scheibel et al. the teaching of or the motivation for removing di- or polybranched compounds, because according to that reference, these compounds are the preferred ones and should not be separated off.

In view of the foregoing, the combination of Maas et al. and Scheibel et al. fails to suggest the process specified in Claim 8. Accordingly, reversal of this rejection is respectfully requested.

Referring to the first full paragraph under section (10) of the Examiner's Answer Appellants confirm that a person of ordinary skill in the art would *not* have from Scheibel et al. the teaching of or the motivation for removing di- or poly-branched compounds.

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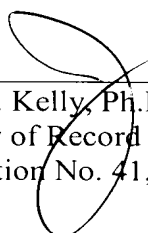
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Respectfully submitted,

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